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TRANSPORTATION STUDY

FOR

FEDERAL OIL SHALE LEASE

TRACT C-b

* * * * *

An Interim Report for

the C-b Shale Oil Project

August 1, 1975

INSPECTION COPY

Please do not remove

U. S. DEPARTMENT OF INTERIOR
OIL SHALE
ENVIRONMENTAL ADVISORY PANEL
Denver Federal Center

IEC INTERNATIONAL ENGINEERING COMPANY, INC.
CONSULTING ENGINEERS

1777 S. BELLAIRE ST. • DENVER, COLORADO 80222

PLANNING ENGINEERING ARCHITECTURE

INTRODUCTION

The purpose of this interim report is to summarize progress on a study of transportation requirements and alternatives associated with the development and operation of oil shale activities on Federal Oil Shale Lease, Tract C-b, in Rio Blanco County, Colorado. The study, when completed, will provide a basis for decisions regarding the implementation of transportation corridors to best serve the interests of the Tract C-b lessees.

The scope of the transportation study is as follows:

1. Investigation of people, goods, and product movement associated with oil shale development and processing on Tract C-b.

2. Review and analysis of existing facilities (road and rail).

3. Conception and analysis of potential new routes (road and rail).

Discussion in the following pages describes some of the assumptions, analysis, and preliminary findings on work completed to date.

for [illegible] pre-development.

(D) Operation (1980 on)

Manpower estimate: 40 employees in 1980, increasing to 900 employees in 1984. Peak employment in 1989 with 1175 workers.

Incoming goods estimate: 15 trucks/day, all legal loads.

Outgoing products estimate: 60 trucks/day with legal loads of coke and sulfur (170 tons/day sulfur and 800 tons/day coke). 150 tons/day ammonia and LPG by pipeline.

Construction and operation activities associated with rail terminal facilities in Rifle and/or Grand Valley were not considered as significant as the above activities from the standpoint of transportation demand. Employees were considered to reside in the community where the terminal facility was being built and/or operated. Incoming materials were assumed to be transported primarily by rail.

A number of activities on Tract C-b are being used as important parameters in conduction of the transportation study. The various construction phases, mine pre-development, and operation of a commercial oil processing plant impose different demands on the transportation system. The following summarizes the major activities on Tract C-b which are being used in the analysis.

(A) Phase I Construction (4/76 to 3/78)

Manpower estimate: 110 to 460 employees, with the duration of peak employment during the first fourteen months.

Income goods estimate: 500 ± tons per month of materials as well as one 15,000 gal. tanker/day bringing in diesel fuel. Four to five overloads expected including a 100 to 150 ton crane.

(B) Mine Pre-Development (4/78 to 4/80)

Manpower estimate: 65 to 75 employees with peak employment during the late summer and fall of 1978.

Income goods estimate: 300 ± tons per month (75 tons explosives, 50 tons roof bolts, 175 tons fuel and lubricants).

(C) Phase II Construction (5/80 to 3/84 - Plant and Dam)
(3/82 - 3/84 - more mine pre-development)

Manpower estimate: increasing number of workers with ploteau of 280 employees in the late fall of 1980 and peak of 2470 workers in mid-1982.

Incoming goods estimate: total of 100,000 tons for plant and dam construction of which 5000 ± loads would be legal and 1000 ± loads would be classified as overloads. 12 ± loads would be tracked and would require crane matting. Two loads would be reactors, each weighing approximately 570 tons. In

EXISTING TRANSPORTATION FACILITIES

A number of facilities were included in the transportation system for analysis. Routes considered of primary importance were State Highway 13, Rio Blanco County Highway 5 (Piceance Creek Road), U.S. 6 - I 70, Parachute Creek Road, and the D&RGW rail route along the Colorado River. A summary of existing facilities follows.

State Highway 13

Potential usage: Between Rifle and Rio Blanco, S.H. 13 may be used for employee commuting, shipment of incoming goods, and product trucking to a rail terminal facility. Between Rio Blanco and Meeker, S. H. 13 will probably be utilized for employee commuting only.

Roadway condition: Good existing roadway geometrics. Pavement is checking in many places. Roadway has settled in many areas.

Important structures: Six concrete box culverts between Rifle and Rio Blanco (3 to 8 foot spans). These show no signs of stress and are in good condition. Three bridges between Rifle and Rio Blanco. All three bridges are rated to carry the maximum legal Colorado Highway load (43 ton). All are in fair to good condition.

Potential problems: Pavement likely to deteriorate rapidly if subjected to proposed construction loads. Detouring existing structures for heavy construction loads may be required.

Piceance Creek Road

Potential usage: Possible employee commuting for entire length. Product and goods shipment between Tract C-b and Rio Blanco (S.H. 13).

ing in many places. Roadway geometrics could be improved.

Important structures: 20 major drainage structures including 4 bridges. All but one bridge are rated to carry maximum legal Colorado Highway loads. None of the bridges are between Rio Blanco and Tract C-b.

Probable required improvements: Increased roadway width and improved alignment. Special pavement design if used for heavy construction loads.

U.S. 6 - 170

Expected to be used for employee commuting only. No anticipated problems.

Parachute Creek Road

Potential usage: Employee commiting and goods and product shipment if new route is constructed between Colony and Tract C-b.

Roadway condition: Poor geometrics. Only a short segment is paved north of Grand Valley.

Probable required improvements: Redesign if used to connect Grand Valley and Tract C-b.

D&RGW Railroad

Potential usage: Terminal facilities in Rifle and/or Grand Valley.

Usable existing sidings: None in Rifle. Spur for siding under construction in Grand Valley for the Colony development.

The following discussion concerns the potential location of new roadway and rail corridors.

Alternative rail routes to Tract C-b were developed beginning at a connection with a railroad proposed by W.R. Grace and Company. The connection with the Grace railroad was at a point approximately 15 miles southwest of Craig, Colorado. The shortest alternative developed was approximately 86 miles in length. The estimated cost for this railroad was approximately $51,500,000.

Six alternative roadway routes from Grand Valley to Tract C-b were studied. All of the six routes utilize essentially the existing road alignment from Grand Valley to Station 250 of the road presently under construction at the Colony development.

Horizontal and vertical alignment for each route was studied on USGS mapping at a scale of 1" = 2000' (7.5 minute series). Design parameters included maximum grade of 7% and maximum degree of curve of 5 degrees. This provides a design speed of 55 mph for passenger vehicles. (Note: The existing construction at Colony has grades up to 8% and curves up to 23 degrees).

As seen in Figure 1, routes 1 and 1a lead to Tract C-b from the south. Both routes follow a ridge for a majority of the way, requiring a poor horizontal alignment. The distances from Grand Valley to Tract C-b for routes 1 and 1a are 41.45 miles and 43.68 miles, respectively. The remaining alternatives require a roadway alignment in East Stewart Gulch. Both horizontal and vertical alignment extremes are at a minimum utilizing this gulch.

Route 2 follows East Stewart Gulch to its intersection with the West Fork, following the West Fork, then ascending the hills crossing Sorghum Gulch at an approximate elevation of 6850 feet and leading into the plant site from the south. An on-site inspection of this route shows construction to be more difficult than previously anticipated.

Routes 3, 4 and 5 connect with the alignment in East Stewart Gulch via utilization of Piceance Creek Road. Route 3 follows Cottonwood Gulch to the proposed plant site. Route 4

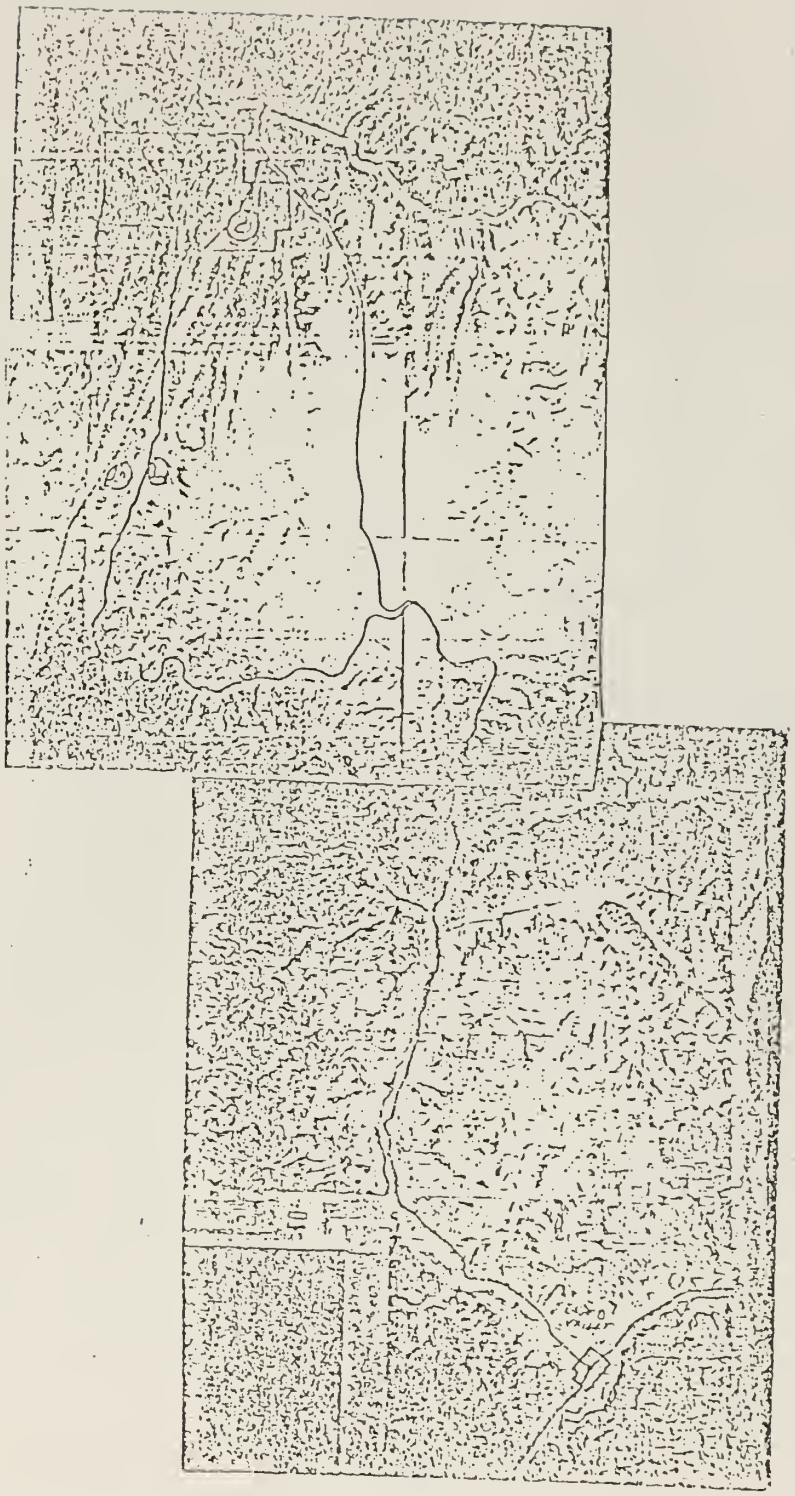


FIGURE 1

Valley to the Tract C-a plant site for routes 2, 3, 4 and 5 are 36.07 miles, 31.71 miles, 33.24 miles, and 36.71 miles, respectively.

Preliminary traffic distribution studies show average daily traffic volumes sufficient to require an AASHTO Type D road for each alternative above. Geometric design standards for a Type D road require two lanes, each ten feet wide with six-foot shoulders. Using these parameters, capital costs were projected for each alternative route (see Table 1).

Of the six alternatives analyzed, route 5 shows the most promising feasibility for three reasons:

1. Alignment - The maximum grade necessary for this route is six percent as opposed to seven percent for the others. In addition, this route is as short as or shorter than the other alternatives, with the exception of route 2.*
2. Cost - With the exception of route 2, it is the most economical (see Table 1).
3. Intersection with Piceance Creek Road - The intersection of route 5 with Piceance Creek Road is better from the standpoint of required sight distance.

* In final analysis, route 2 was not considered a viable alternative due to its encroachment on the spent shale disposal area (Sorghum Gulch).

TABLE 1

CAPITAL COSTS

GRAND VALLEY TO C-b PLANT SITE

Description	Upgrading to Colony (Sta. 100)		Existing Const. at Colony (Sta. 100-250)		New Const. Stewart Gulch to Piceance Ck. Rd.		Upgrading Along Piceance Ck. Rd.—		New Const. to Plant		Recap Total	
	Miles	Cost	Miles	Cost	Miles	Cost	Miles	Cost	Miles	Cost	Miles	
Route 1	14.38	$2,130,000	2.84	$6,004,000	23.66	$8,636,000	--	--	0.57	$ 208,000	41.45	$16,7
Route 1a	14.38	$2,130,000	2.84	$6,004,000	25.89	$9,450,000	--	--	0.57	$ 208,000	43.68	$17,7
Route 2	14.38	$2,130,000	2.84	$6,004,000	15.63	$5,705,000	--	--	3.22	$1,175,000	36.07	$15,1
Route 3	14.38	$2,130,000	2.84	$6,004,000	15.63	$5,705,000	1.50	$ 475,000	2.27	$ 829,000	36.71	$15,
Route 4	14.38	$2,130,000	2.84	$6,004,000	15.63	$5,705,000	3.60	$1,076,000	3.79	$1,383,000	38.24	$16,2
Route 5	14.38	$2,130,000	2.84	$6,004,000	15.63	$5,705,000	1.59	$ 475,000	2.27	$ 829,000	36.71	$15,

Note: For comparison of the above figures, the cost of improving existing roads (Piceance Creek Road) from Tract C-b to Rifle was determined (this assumes a rail terminal facility in Rifle). Upgrading to Type D standards would require an expenditure of $11,960,000.

The following discussion presents an economic evaluation of various route and terminal facility alternatives for operating loads associated with Tract C-b. For analysis purposes, two basic conditions were assessed:

1. Tract C-b only in operation at 50,000 BSD.
2. Tract C-b and Colony both in operation, each at 50,000 BSD.

The basic assumptions used in the analysis are as follows:

A. Interest: 8%

B. Life of project(s) and roads: 30 years

C. Working days/year: 260

D. Truck operating and maintenance costs (T), including 4¢/mi road fees: 79¢/mi (increasing 8¢/year).

$$T = 0.79 + (.08)(9.1897) = \$1.525$$

E. Annual road maintenance fees (R): $1350/mi (increasing $135/yr)

$$R = 1350 + 135\ (9.1897) = \$2591.00$$

F. Trucks/day/development: 75 (60 outgoing, 15 incoming)

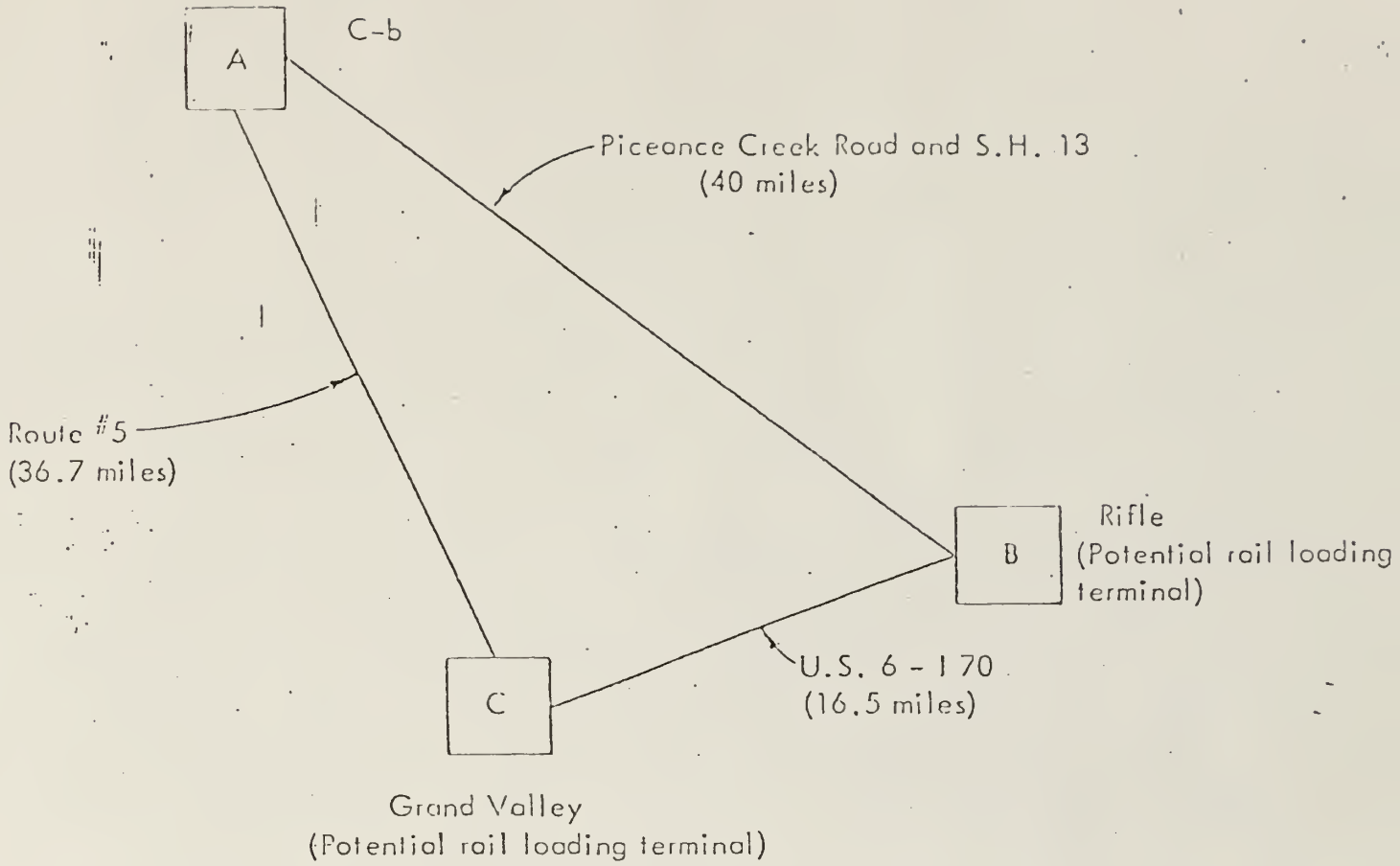
G. Cost of one rail terminal facility serving one development: $7,000,000

H. Cost of one rail terminal facility serving two developments: $10,900,000

I. If a new route was constructed connecting Grand Valley and Tract C-b, it would be the route 5 alternative discussed earlier.

Case 1: Tract C-b only

Figure 2 shows a schematic of Case 1. 'A' is used to designate Tract C-b, 'B' is used to designate Rifle, and 'C' is used to designate Grand Valley. Two locations are available for rail terminal sites, Rifle (point B) and Grand Valley (point C).



Case #1

FIGURE 2

Alternative I: From A to B, upgrading Piceance Creek Road, terminal at B.

Alternative II: From A to B to C, upgrading Piceance Creek Road, terminal at C. (Note: in evaluation of this alternative, no cost was was included for upgrading or maintaining U.S. 6 - 170 between B and C.)

Alternative III: From A to C, constructing route 5, terminal at C.

The distance from A to B is 40 miles.

Relating all costs to present worth:

Upgrading Piceance Creek Road -		$11,960,000
Road Maintenance -($2591/mi) (40 mi) (11.258) =		1,166,779
Truck operating and road fees - ($1.525/mi) (2 trips) (40 mi) (75 trucks) (260 days) (11.258) =		26,782,782
	Sub-total	$39,909,561
	+ Terminal cost	7,000,000
	Total	$46,909,561

Alternative II: Using the concept of placing a rail terminal at C (Grand Valley) and using existing roads, the trucking distance from A to B to C is 56.5 miles.

Relating all costs to present worth:

Upgroding Piceance Creek Road -		$11,960,000
Road Maintenance -($2591/mi) (40 mi) (11.258) =		1,166,779
Truck operating and road fees -($1.525/mi) (2 trips) (56.5 mi) (75 trucks) (260 days) (11.258) =		37,830,680
	Sub-total	$50,957,459
	+ Terminal Cost	7,000,000
	Total	$57,957,459

or by constructing route 5, the distance from A to C is 36.7 miles.

Relating all costs to present worth

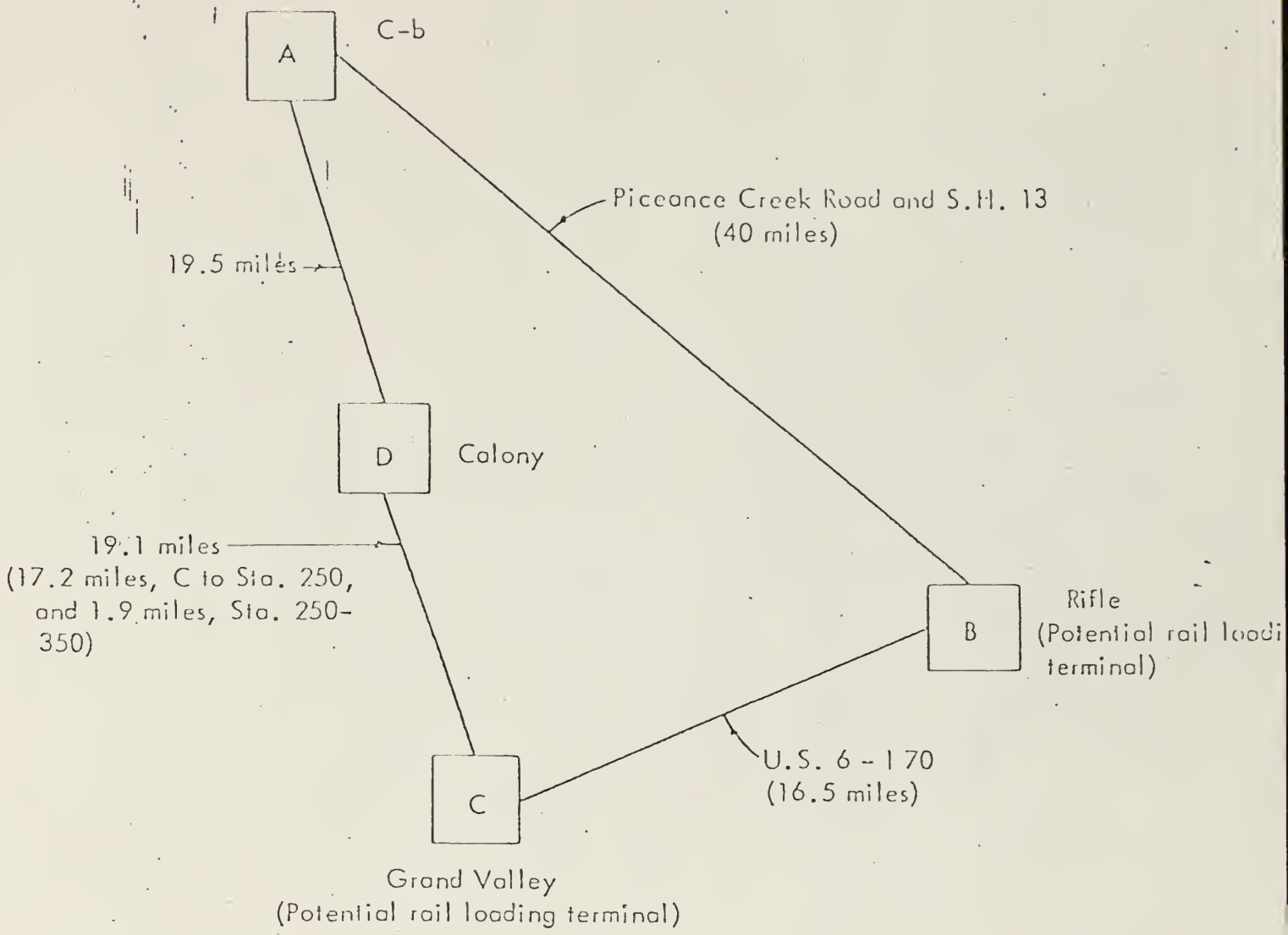
Construction of route 5 -		$15,143,000
Road Maintenance - ($2591/mi) (36.7 mi) (11.258) =		1,070,520
Truck operating and road fees - ($1.525/mi) (2 trips) (36.7 mi) (75 trucks) (260 days) (11.258) =		24,573,202
	Sub-total	$40,786,722
	+ Terminal Cost	7,000,000
	Total	$47,786,722

From the above analysis, the most economical transportation system is utilization of existing roads and locating a terminal facility at Rifle.

It should be noted that approximately five million dollars has already been expended for construction of part of route 5 (road at Colony) and a rail spur at Grand Valley. Furthermore, the above analysis does not take into consideration the probability of a product pipeline from Tract C-b to Grand Valley, with at least facilities for liquid handling at Grand Valley. If these factors are taken into account, the most economical alternative is the construction of route 5.

Case 2: Tract C-b and Colony

Figure 3 shows a schematic of Case 2. Points A, B, and C are the same as for Case 1. Point D has been added to denote the Colony development. Again, two locations are available for oil terminal sites, Rifle (Point B) and Grand Valley (Point C).



Case #2

FIGURE 3

Alternative I: From A to B, upgrading Piceance Creek Road, and from D to C, upgrading Parachute Creek Road, terminals at B and C.

Alternative II: From A to B, upgrading Piceance Creek Road, and from D to C to B, upgrading Parachute Creek Road, one terminal at B. (Note: in evaluation of this alternative, no cost was included for upgrading or maintaining U.S. 6 - I 70 between B and C).

Alternative III: From A to B to C, upgrading Piceance Creek Road, and from D to C, upgrading Parachute Creek Road, one terminal at C. (Note: costs for U.S. 6 - I 70 omitted from the analysis).

Alternative IV: From A to D to C and from D to C, constructing route 5, one terminal at C.

Alternative V: From A to D to C to B and from D to C to B, constructing route 5, one terminal at B. (Note: costs for U.S. 6 - I 70 omitted from the analysis).

[illegible] D to C is 19.1 miles.

Relating all costs to present worth:

Upgrading Piceance Creek Road -	$11,960,000
Colony Road (Sta. 100 – 350) -	10,000,000
Upgrading Parachute Creek Road -	2,130,000
Road Maintenance - ($2591/mi)(40 mi + 19.1 mi)(11.258) =	1,723,916
Truck operating and road fees - ($1.525/mi) (2 trips) (59.1 mi) (75 trucks/development) (260 days) (11.258) =	39,571,560
Sub-total	$65,385,476
+ two terminals	14,000,000
Total	$79,385,476

Alternative II: Using the concept of one rail terminal at B (Rifle) serving both Colony and C-b, and no new route from Tract C-b to Colony, the trucking distance from A to B is 40 miles and from D to C to B is 35.6 miles.

Relating all costs to present worth:

Upgrading Piceance Creek Road -	$11,960,000
Colony Road (Sta. 100 - 350) -	10,000,000
Upgrading Parachute Creek Road -	2,130,000
Road Maintenance - ($2591/mi) (40 mi + 19.1 mi) (11.258) =	1,723,916
Truck operating and road fees - ($1.525/mi) (2 trips) (40 mi + 35.6 mi) (75 trucks/development) (260 days) (11.258) =	50,619,458
Sub-total	$76,433,374
+ one terminal	10,900,000
Total	$87,333,374

located at C (Grand Valley) serving both C-b and Colony, with truck travel from C-b by way of Piceance Creek Road, S.H. 13, and U.S. 6 - 170.

Alternative IV: Using the concept of one rail terminal at C (Grand Valley) serving both Colony and C-b, and constructing route 5, the distance from A to C is 36.7 miles and from D to C is 19.1 miles.

Relating all costs to present worth:

Construction of route 5 -		$15,143,000
Colony Road (Sta. 250 - 350)		4,000,000
Road Maintenance - ($2591/mi)(36.7 mi + 1.9 mi)(11.258) =		1,125,943
Truck operating and road fees - ($1.525/mi) (2 trips) (36.7 mi + 19.1 mi) (75 trucks/development) (260 days) (11.258) =		37,361,981
	Sub-total	$57,630,923
	+ one terminal	10,900,000
	Total	$68,530,923

Alternative 2: Using the concept of one rail terminal at B (Grand Valley) serving both C-b, C-b, and Colony via route 5, the distance from A to D to C to B is 53.2 miles and from D to C to B is 35.6 miles.

Relating all costs to present worth:

Construction of route 5 -	$15,143,000
Colony Road (Sta. 250 - 350) -	4,000,000
Road Maintenance - ($2591/mi) (36.7 mi + 1.9 mi) (11.258) =	1,125,942
Truck operating and road fees - ($1.525/mi) (2 trips) (53.2 mi + 35.6 mi) (75 trucks/development) (260 days) (11.258) =	59,457,776
Sub-total	$79,726,718
+ one terminal	10,900,000
Total	$90,626,718

From the above analysis, constructing route 5 and locating one terminal facility at Grand Valley to serve both C-b and C-b and Colony is the most economical.

It should be noted that although 8 percent was used as the interest rate in the above analysis, comparisons were also made using interest rates from 6 to 12 percent and the same relative results were obtained.

Due to the incipient nature of this interim report, a detailed discussion of overloads is not presented here, but will appear in the final report. Based on preliminary investigations, certain problems and/or costs could be anticipated if existing roads are utilized (say a rail terminal at Rifle and utilization of S.H. 13 and Piceance Creek Road). These are as follows:

1. Detouring existing structures for some heavy construction loads.
2. Costs for repaving to be incurred by the Tract C-b lessees.
3. Possible difficulties in obtaining some overload permits from the State of Colorado.

Information relating to overloads has been assembled and is included in the Appendices of this report. Appendix A is information obtained from the Colorado Department of Highways and Appendix B is information obtained from Rio Blanco County.

APPENDIX A

Colorado Department of Highways

Overload Information

Based upon an incomplete analysis, a transportation system (not a pipeline) could not be recommended at this time. However, it does appear that the best access to the tract from Piceance Creek Road is via the gulch used for the alignment of route 5. (This gulch is just west of Cottonwood Gulch.) Also, the joint use of a terminal facility at Grand Valley for both the Colony development and Tract C-b appears to be a viable and economical alternative if a new route is constructed connecting C-b and Grand Valley.

LEGAL LOAD LIMITS

(Maximum Weights are Total Gross Weights of Vehicle and Load)

-- Interstate --

Maximum Weight on any one axle (with low pressure tires).....20,000 lbs
Maximum gross vehicle weight on any vehicle combination is.....80,000 lbs

$W = 500\left(\frac{LN}{N-1} + 12N + 36\right)$. W being gross vehicle weight; L being distance in feet between first and last axle; N being number of axles.

-- Non-Interstate --

Maximum Weight on any one axle (with low pressure tires).....18,000 lbs
Maximum gross vehicle weight on any vehicle combination is.....85,000 lbs

W= (L+40) X 1000. W being gross vehicle weight; L being distance in feet between first and last axle in feet.

*Maximum Height (Total distance from ground to top part of load).13 ft. 6 in
Maximum Width..... 8 ft
Maximum Length any Combination of Vehicles..... 65 ft
**Maximum Width permitted Eisenhower Tunnel..... 14 ft
Maximum Height permitted in Eisenhower Tunnel..... 13 ft. 6 in

*Except S. Hwy. 207..... Brid
S. Hwy. 265 at Denver City Limits ..... R. R. Underpa
S. Hwy. 6 Clear Creek Canyon.....Tunne

THESE STRUCTURES DO NOT HAVE SUFFICIENT OVERHEAD CLEARANCE TO PERMIT THE PASSING OF VEHICLES 13 FT. 6 IN. IN HEIGHT

* permit loads over 12' must stop in tunnel parking lot and obtain permission from portal attendant before entering tunnel.

On designated State Highways

Every such permit shall be carried in the vehicle or combination of vehicles to which it refers and shall be open to inspection by any police officer or authorized agent of any authority granting such permits and no person shall violate any of the terms or conditions of such special permit.

On overheight permits

YOUR RESPONSIBILITY TO CHECK ALL LOW OVERHEAD STRUCTURES

([illegible])

[illegible] by the applicant that the acceptance [illegible] permit [illegible] by on those highways under the jurisdiction of the State [illegible] Highways, Division of Highways, State of Colorado. To operate on [illegible] other jurisdiction (County Highways or local streets) it is necessary [illegible] a separate permit from the local authorities having jurisdiction there[illegible] over. (Movable structures excepted.)

The signer of the permit agrees:

1. To take every precaution to protect the highway and the traffic from damage or injury, using pilot cars or flagmen to warn the traveling public on all blind curves, both vertical and horizontal.

2. In case of overwidth of load, the same is to be placed on the vehicle with the overhangs as far to the right as possible, and in any event the materials shall be loaded so as to present the minimum hazard to traffic.

3. To make this traffic movement only between DAYLIGHT and DARK, and to remove the load from the highway except between these hours.

4. To be financially responsible and to make prompt payment for any damage caused to the traffic, to traffic lights, overhead signs, wires, cables and other installations or to the highway or bridges by the transportation of this load in excess of limitation prescribed by statute.

5. That the operator of the vehicle or vehicles is duly licensed according to statute.

6. To operate the vehicle or vehicles at all times in accordance with any and all provisions of law, except as exempted herein.

7. Except when a permit is requested and granted for overweight, the undersigned applicant specifically states that this load is legal weight; and that same cannot be loaded to conform with the statute. He certifies that he understands and accepts all provisions and requirements of this permit, including the provisions on the reverse side.

8. Applicant agrees to indemnify and hold harmless the State of Colorado, the State Division of Highways, its officers and employees, appointed officials and all members of the State Highway Commission from all suits, actions or claims of any character whatsoever brought because of any injuries or damage received by any person, persons or property arising from the issuance or use of this permit.

PERMITS NOT GOOD

Saturday P.M., Sunday, or Holidays and become VOID during blizzard, heav[illegible] snow or icy road conditions. Overwidth, Overheight and loads exceeding 65 f[illegible] in length must not travel at any time through tunnels, on U.S. Highway 6 We[illegible] of Denver, in Clear Creek Canyon, or on the Highways listed below during hou[illegible] 7 A.M. to 9 A.M. and 4 P.M. to 6 P.M., Monday through Friday.

HIGHWAYS

Colorado Springs on I-25 between Jct. S.H. 83 on the South to Jct. I-25 Business route (Nevada Ave.) on the North. Pueblo on I-25 from Lake Avenue [illegible] 40th Street. Denver I-25 - S.H. 88 Belleview to S.H. 128; I-70 - S.H. 72 ([illegible] Rd) to I-225. I-80 - I-25 to S.H. 85. S.H. 6 (W. 6th Ave.) - Indiana to I[illegible] I-25 to S.H. 287 (Federal), U.S. 285 - I-25 to Sheridan Blvd., S.H. 95.

SPECIAL PERMIT INFORMATION

This form must be completed, and signed, to certify that all information contained herein is correct:

Shipment Consists of: _____

From _____ Colo: To _____

Over State Highways _____

On Following Dates: _____ No. of Trips: _____

Make and Type of Vehicle _____ Motor No. _____

Vehicle License _____ Trailer License _____

Special License _____ Trl. House Serial _____ PUC Permit No. _____

Gross Weight _____ No. of Axles _____ Dist. 1st to last Axle _____

Overall Length _____ Front Overhang _____

Height _____ Width _____

APPLICANT'S NAME _____

APPLICANT'S ADDRESS _____

_____

APPENDIX B

Rio Blanco County

Overload Information

901. Definition. The word "vehicle" shall mean every device in, upon, or by which any person or property is or may be transported or drawn upon a public highway, excepting devices moved by human power or used exclusively upon stationery rails or tracks.

902. Permit Required. No vehicle which exceeds the legal load limits set forth in paragraph 903 below shall be operated on any Rio Blanco County road without the operator thereof having first obtained permission and a special permit from the Rio Blanco County Road Supervisor or his designated agent.

903. Load Limits. The following shall be the legal load limits on the county roads of Rio Blanco County:

(a) Maximum weight on any one axle (with low pressure tires).....18,000 lbs.
(b) Maximum weight on a two-axle vehicle.....30,000 lbs.
(c) Maximum weight on single vehicle with three or more axles.....46,000 lbs.
(d) Maximum weight on any combination of vehicles is 800 (L+40), L being the distance between the center of first and last axles in feet and inches.
(e) Maximum height (total distance from ground to top part of load.....13 ft. 6 in.
(f) Maximum width.....8 ft.
(g) Maximum length, single vehicle.....35 ft.
(h) Maximum length any combination of vehicles.....65 ft.

904. Applications for Permit. Applications for a special permit shall specifically describe the vehicle or vehicles and load to be operated or moved and the particular roads for which permit to operate is requested, and whether such permit is for a single trip or for continuous operation and the time of such movement.

905. Issuance of Permit; Security. The county road supervisor or his designated agent is authorized to issue or withhold such special permit at his discretion; or, if such permit is issued, to limit the number of trips, or to establish seasonal or other time limitations within which the vehicles described may be operated on the roads indicated, or to otherwise limit or prescribe against undo damage to the road, foundations, services, or structures, and may require such undertaking or other security as may be deemed to compensate for any injury to any roadway or road structure.

be carried in the vehicle or combination of vehicles to which it refers and shall be open to inspection by any police officer or authorized agent of any authority granting such permit, and no person shall violate any of the terms or conditions of such special permit.

907. Penalty. It is a misdemeanor for any person, firm or corporation to violate any of the provisions of this resolution and every person, firm or corporation so convicted shall be fined not less than $25.00, nor more than $300.00 for each violation. Each day that a violation continues under the provisions of this resolution shall be considered a separate and distinct violation.

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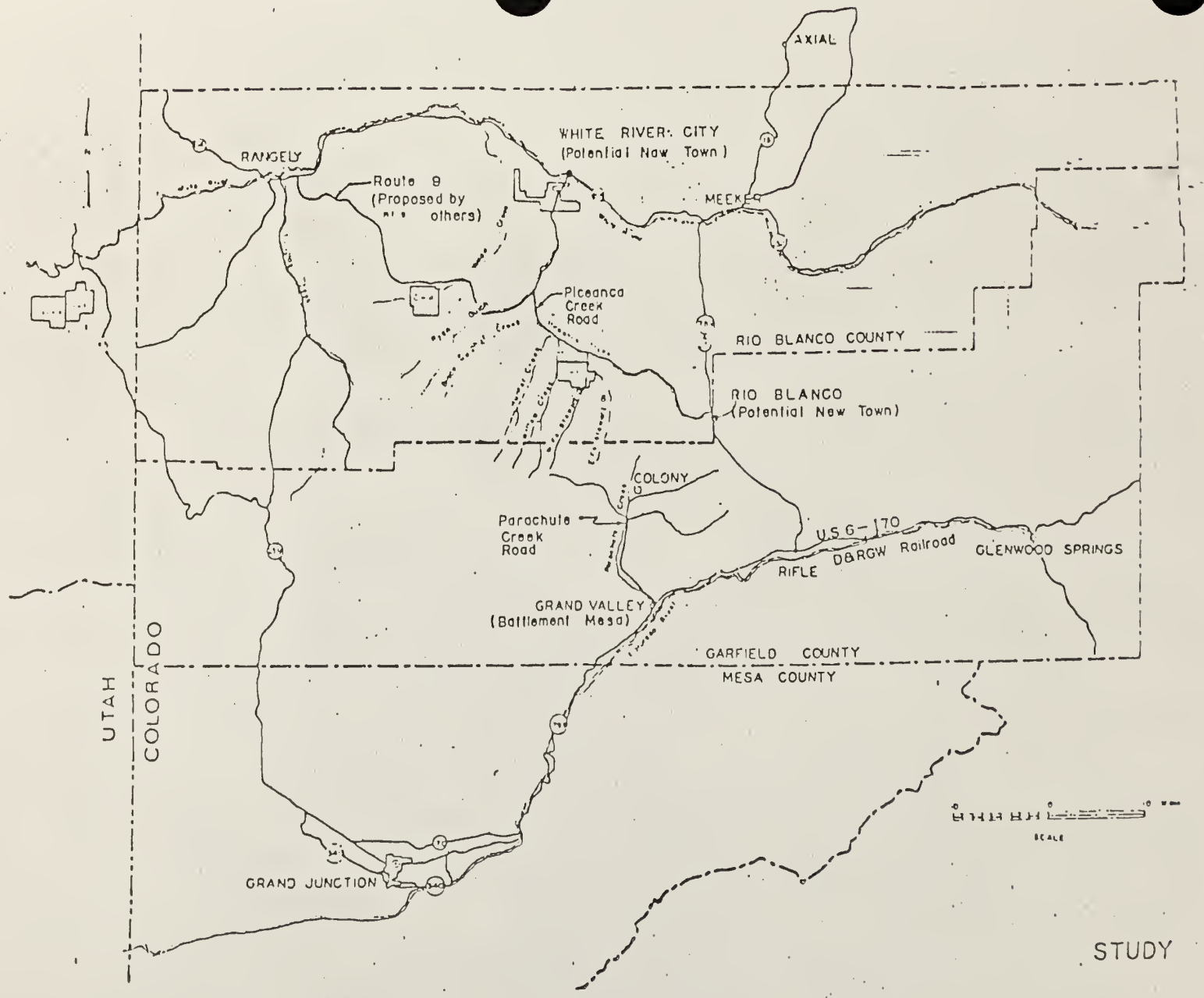
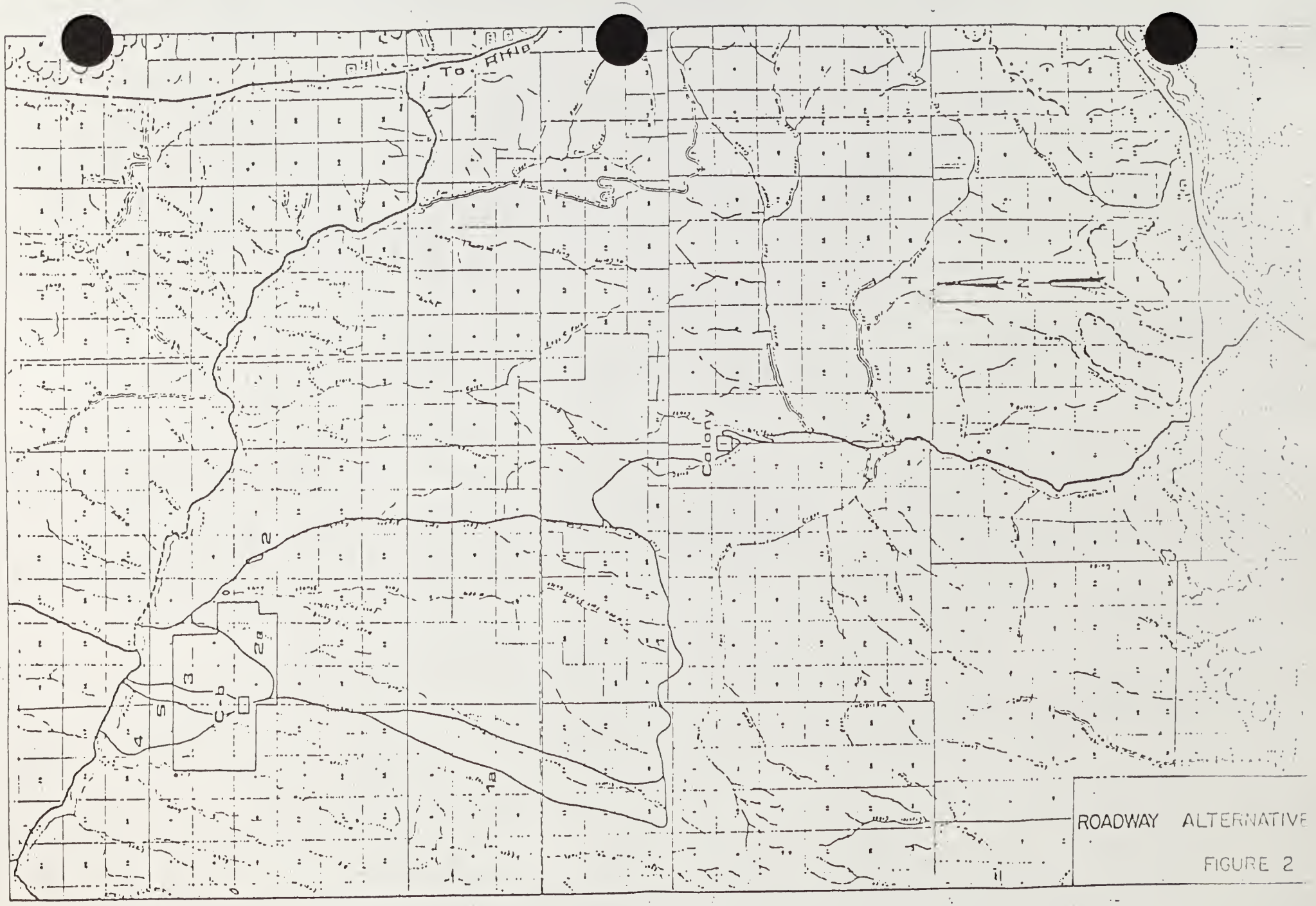


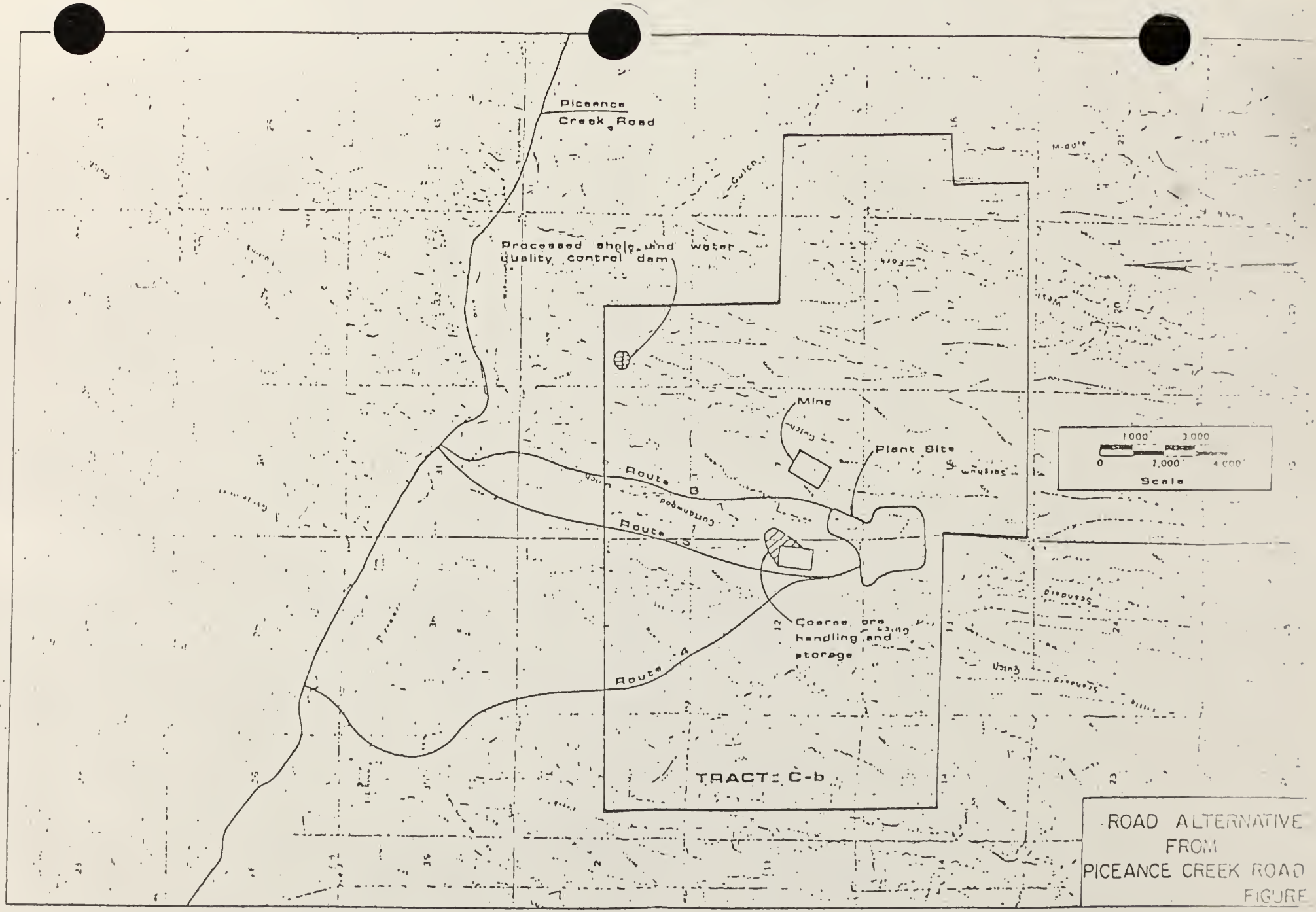
STUDY AREA MAP

FIGURE



ROADWAY ALTERNATIVE

FIGURE 2



ROAD ALTERNATIVE
FROM
PICEANCE CREEK ROAD
FIGURE

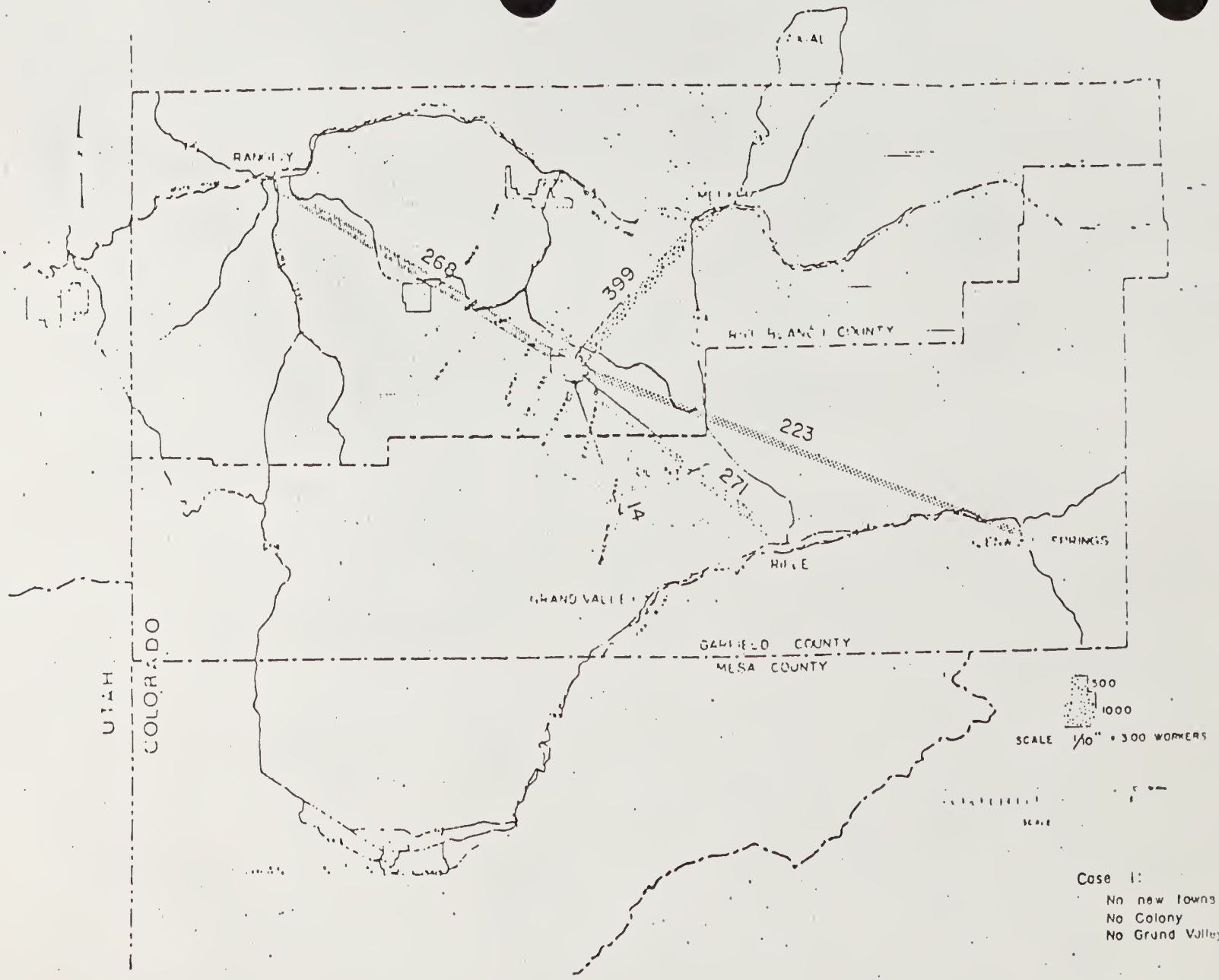

268
399
223
271
14
GARFIELD COUNTY
MESA COUNTY
UTAH
COLORADO
300
1000
SCALE 1/10" = 300 WORKERS
Case 1:
No new towns
No Colony
No Grand Valley - Cb route

FIGURE 4

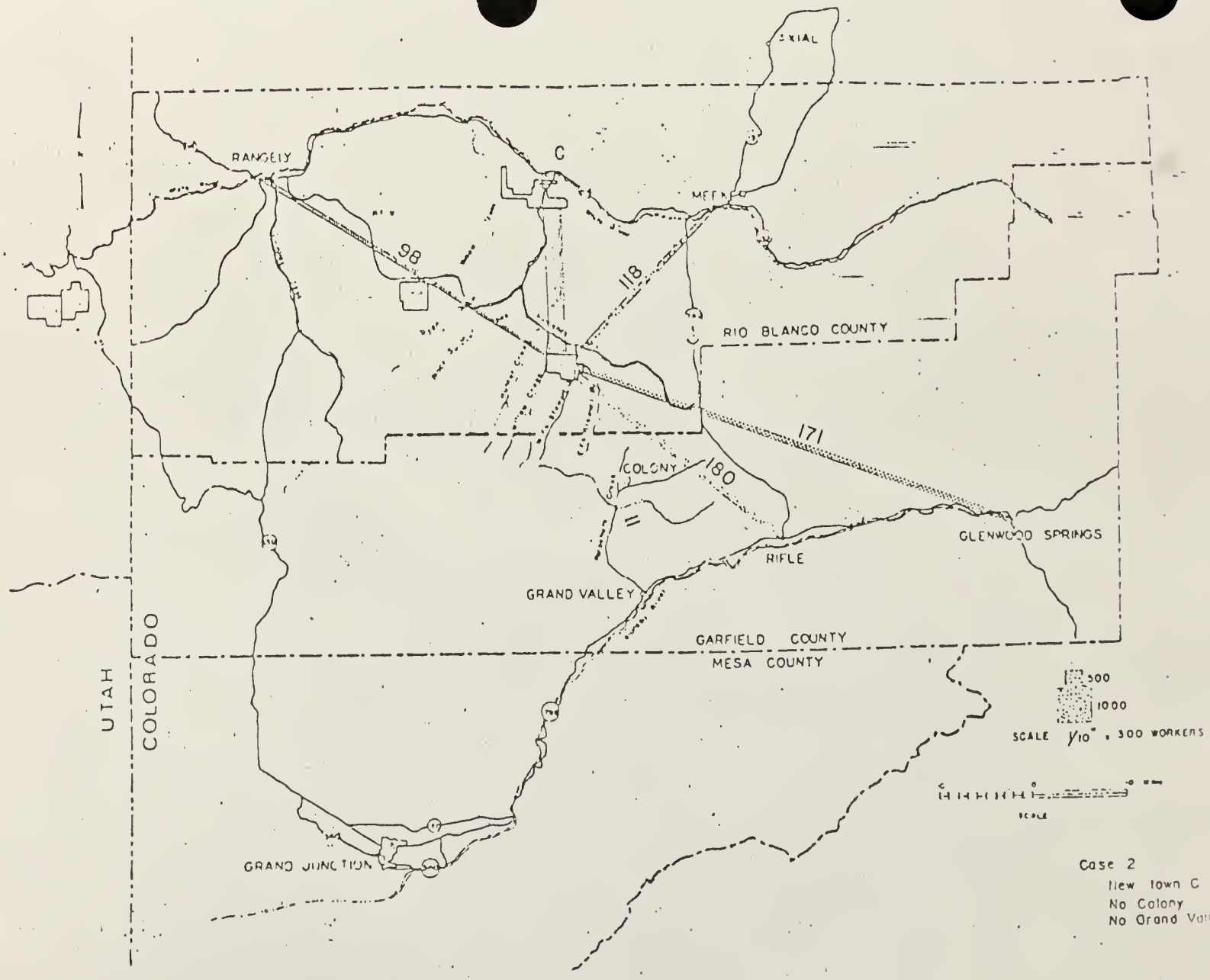
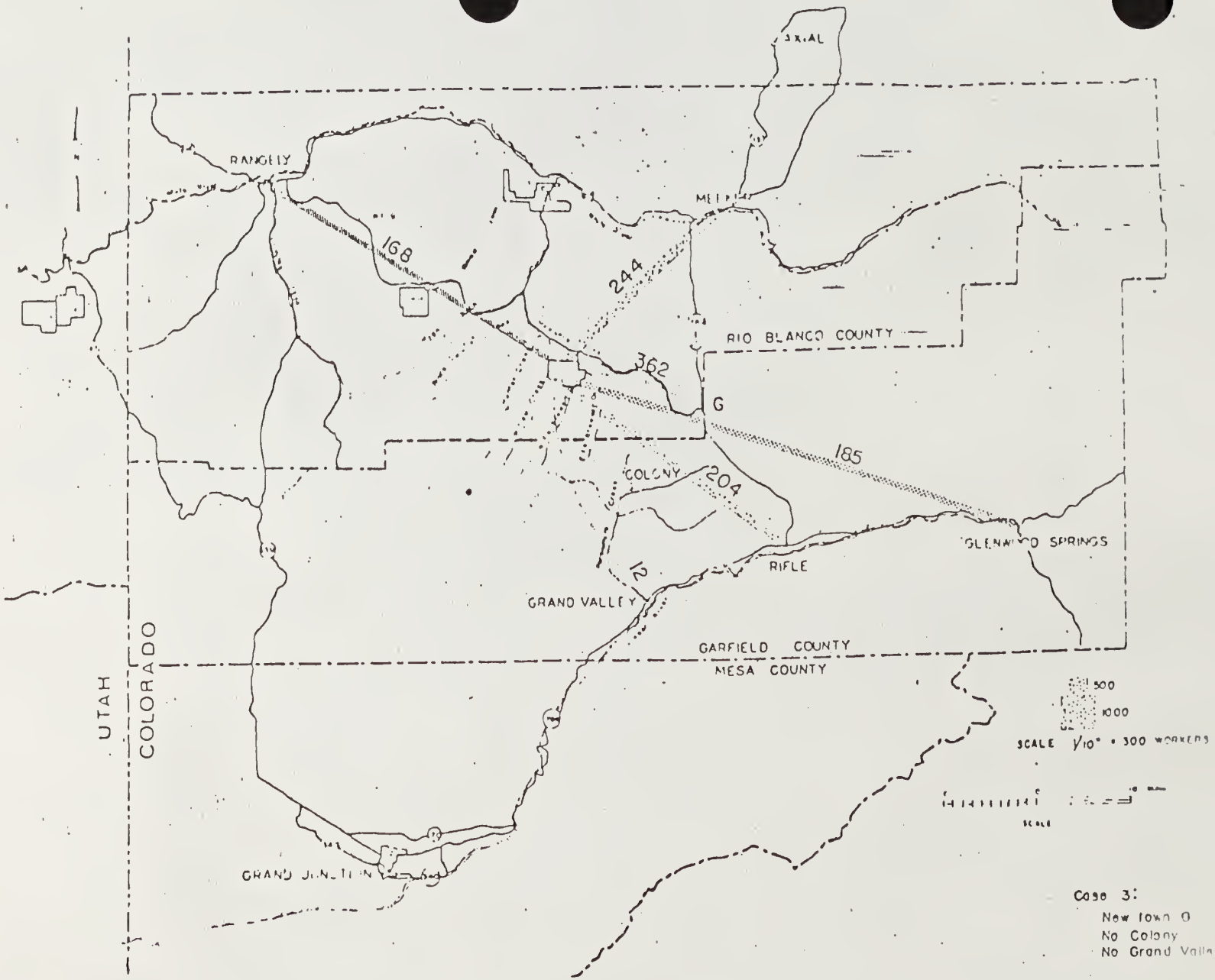

AXIAL
RANGELY
C
MEEK
98
118
RIO BLANCO COUNTY
171
COLONY
180
GLENWOOD SPRINGS
RIFLE
GRAND VALLEY
GARFIELD COUNTY
MESA COUNTY
UTAH
COLORADO
500
1000
SCALE 1/10" = 300 WORKERS
GRAND JUNCTION
Case 2
New Town C
No Colony
No Grand Valley - Cb route

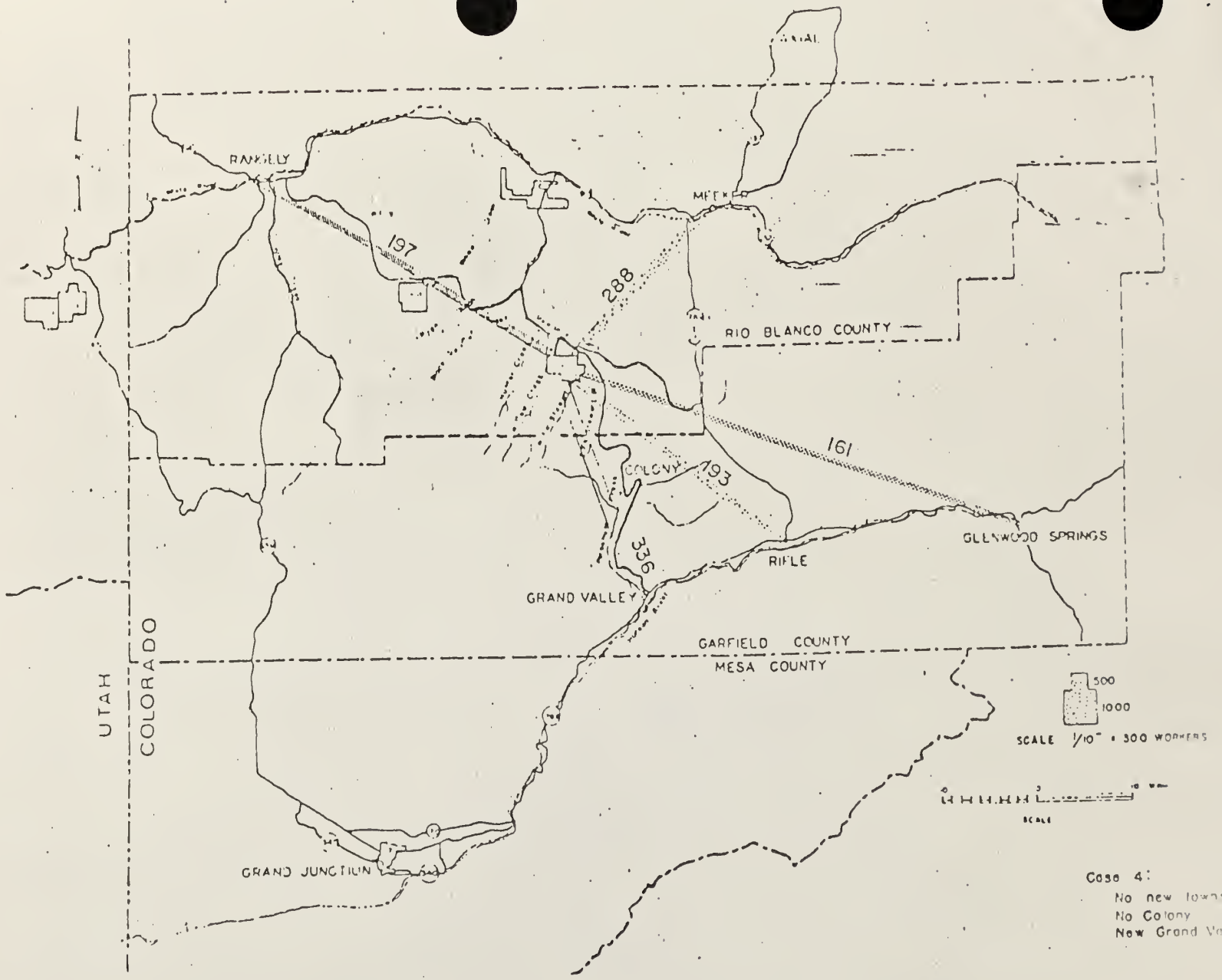
FIGURE 5



Case 3:

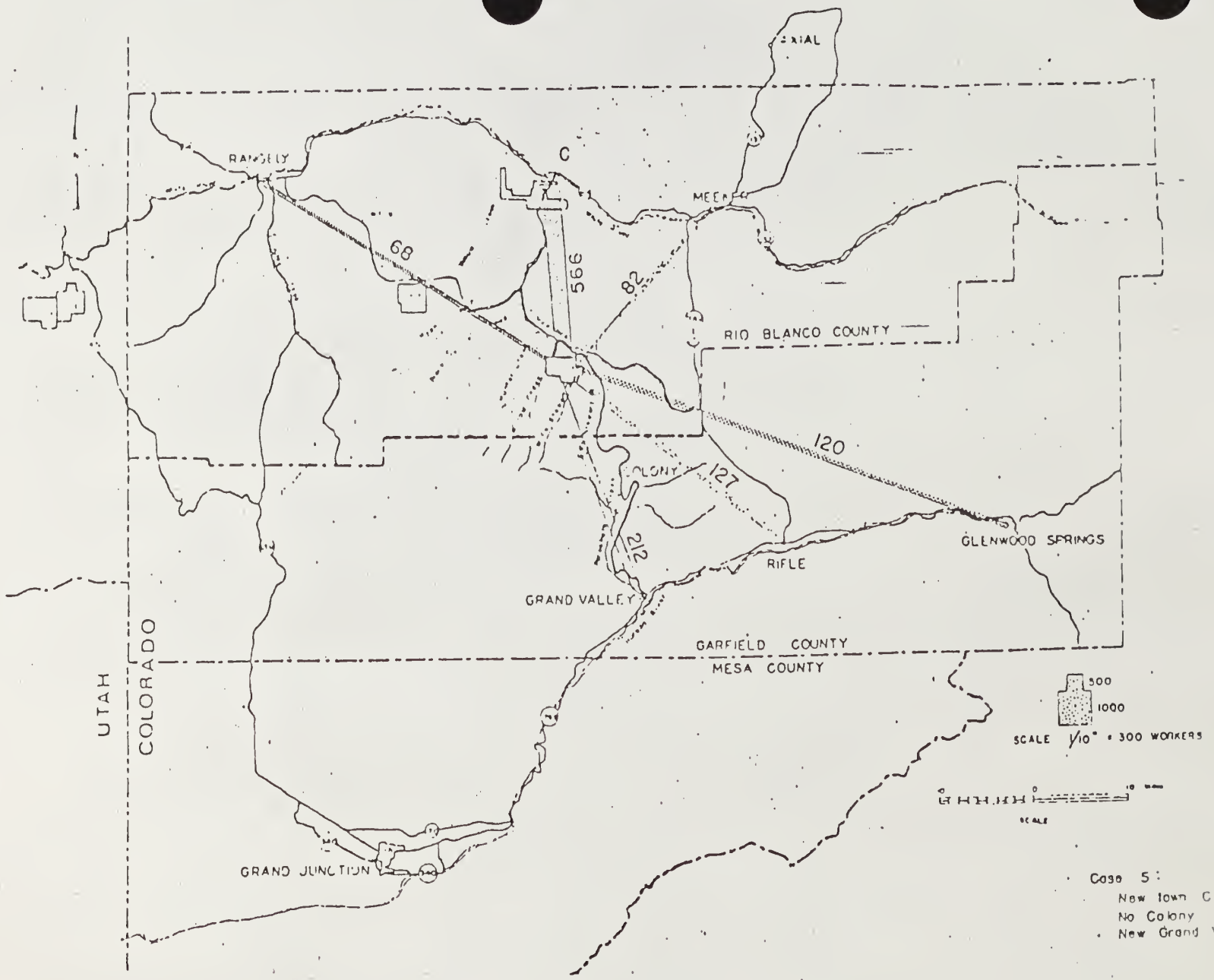
New town G
No Colony
No Grand Valley - Gb route

FIGURE



Case 4:
No new towns
No Colony
New Grand Valley - CR rr

FIGURE 7



Case 5:
New town C
No Colony
New Grand Valley-CO route

FIGURE 8

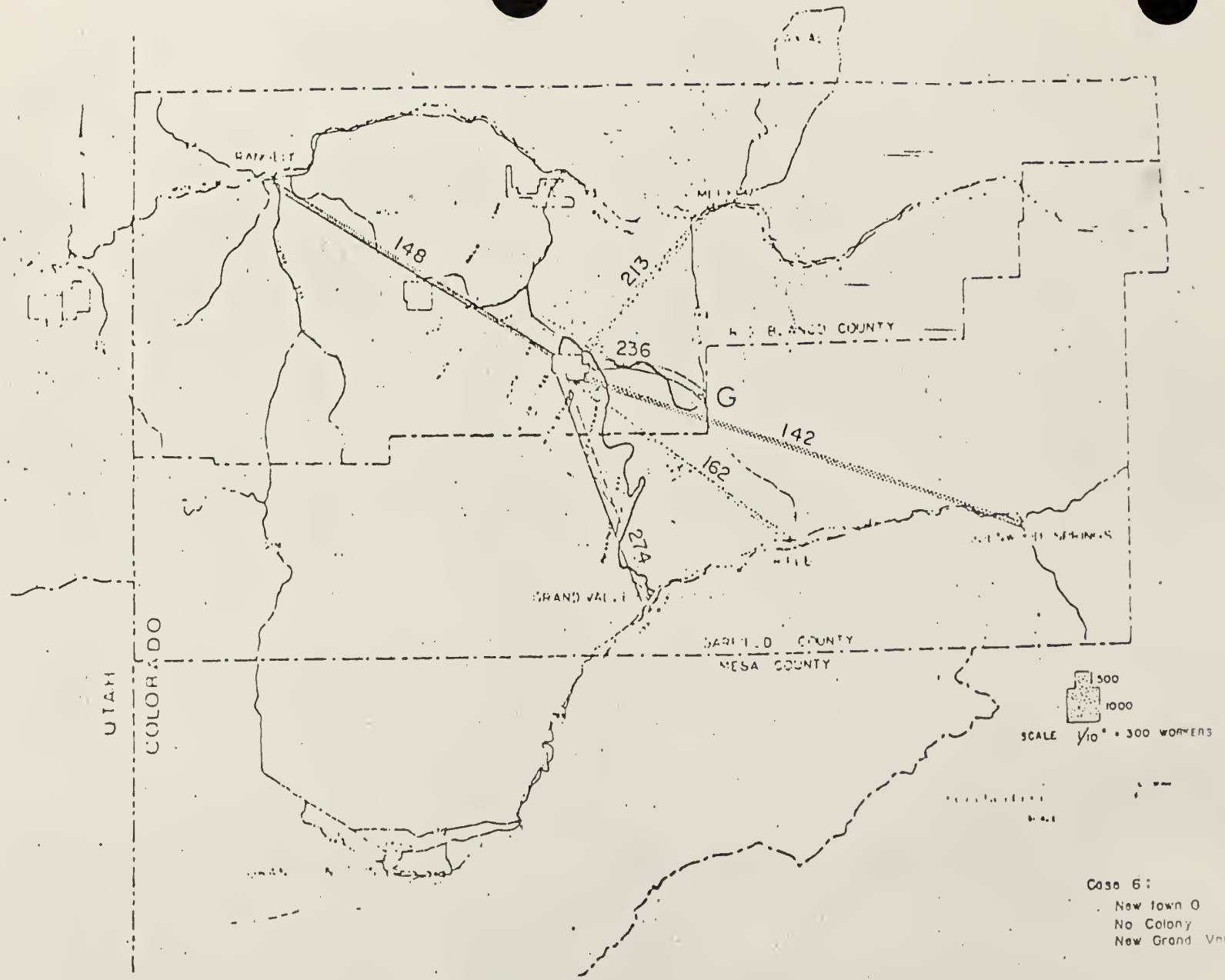
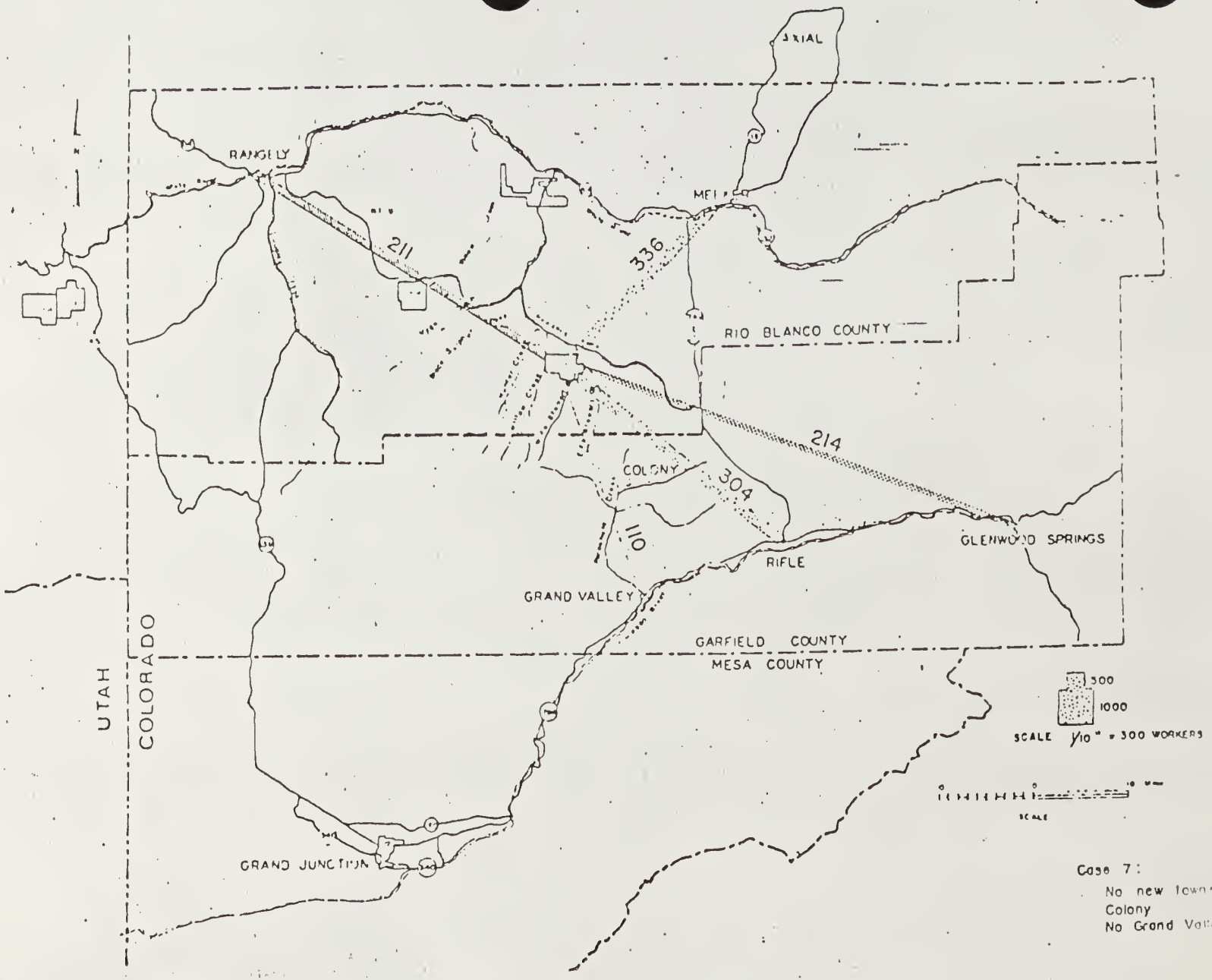

148
213
236
G
142
162
274
UTAH
COLORADO
GRAND VALLEY
MESA COUNTY
500
1000
SCALE 1/10" = 300 WORKERS
Case 6:
New town O
No Colony
New Grand Valley-Loop route

FIGURE 9



Case 7:
No new towns
Colony
No Grand Valley-CO route

FIGURE 10

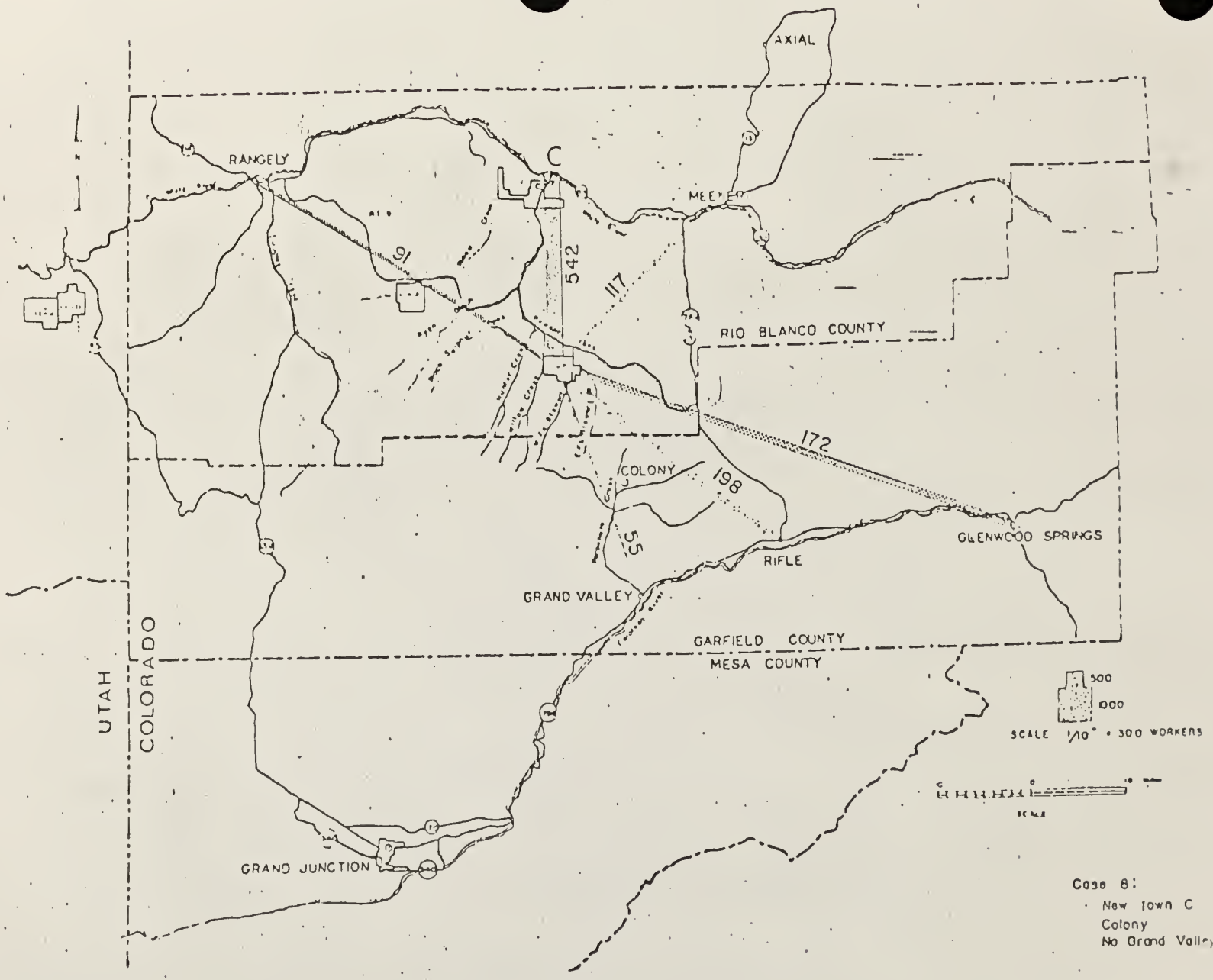

AXIAL
RANGELY
C
MEEKER
91
542
117
RIO BLANCO COUNTY
172
COLONY
198
55
GLENWOOD SPRINGS
RIFLE
GRAND VALLEY
GARFIELD COUNTY
MESA COUNTY
UTAH
COLORADO
500
000
SCALE 1/10" = 300 WORKERS
GRAND JUNCTION
Case 8:
New town C
Colony
No Grand Valley - Co route

FIGURE 11

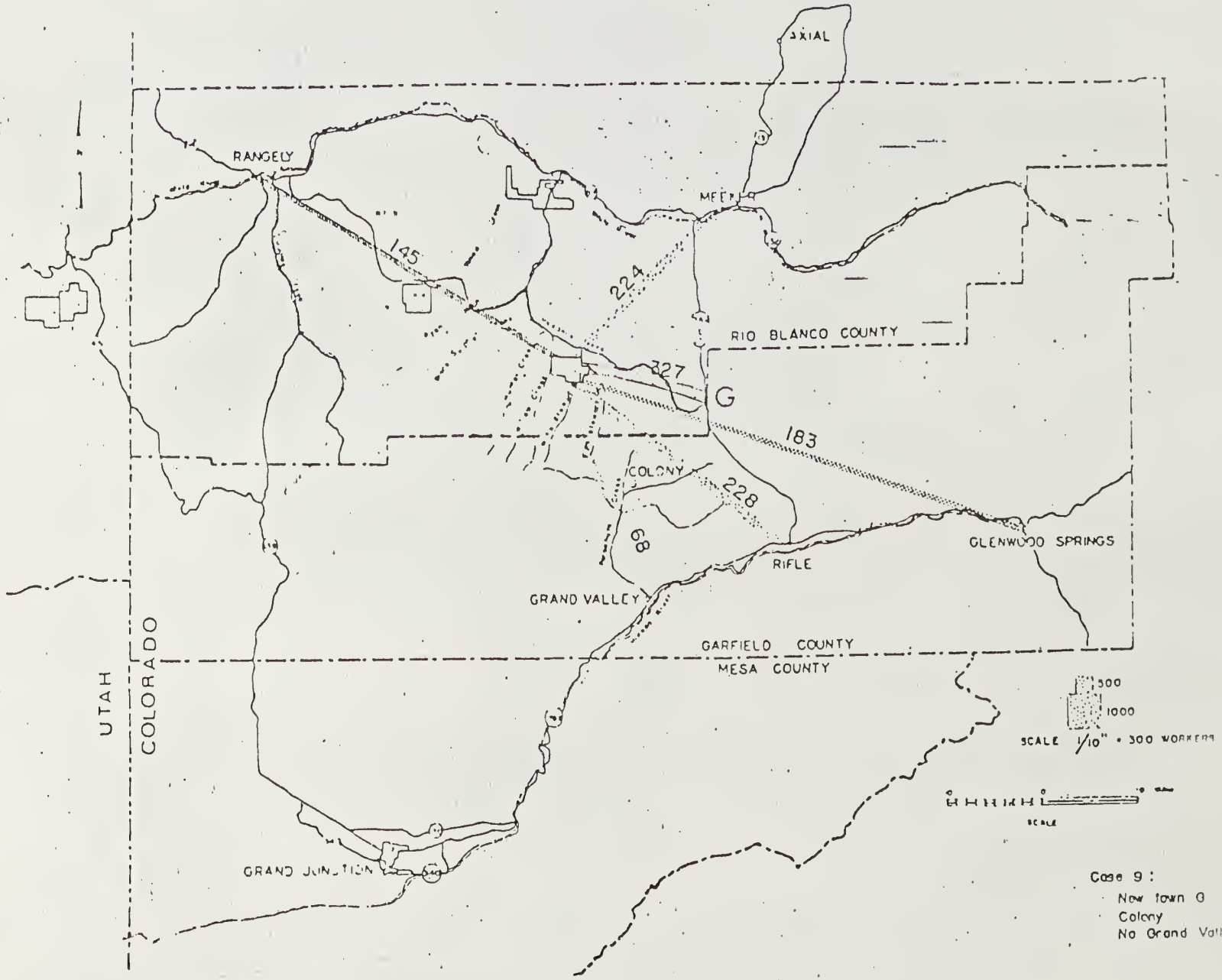
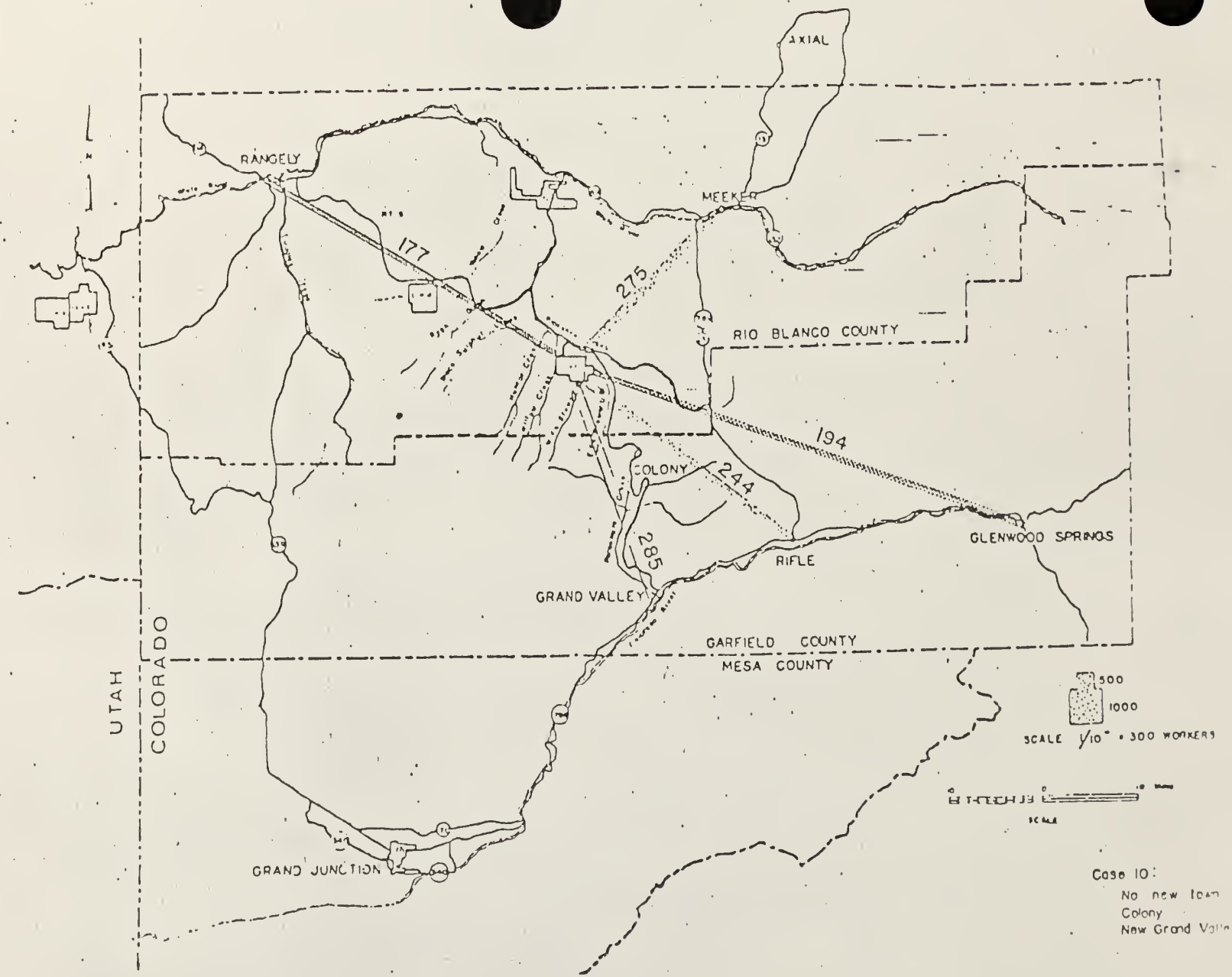

AXIAL
RANGELY
MEEKER
145
224
RIO BLANCO COUNTY
327
G
183
COLONY
228
68
GLENWOOD SPRINGS
RIFLE
GRAND VALLEY
GARFIELD COUNTY
MESA COUNTY
UTAH
COLORADO
500
1000
SCALE 1/10" = 300 WORKERS
GRAND JUNCTION
Case 9 :
New town G
Colony
No Grand Valley—Co route

FIGURE 12



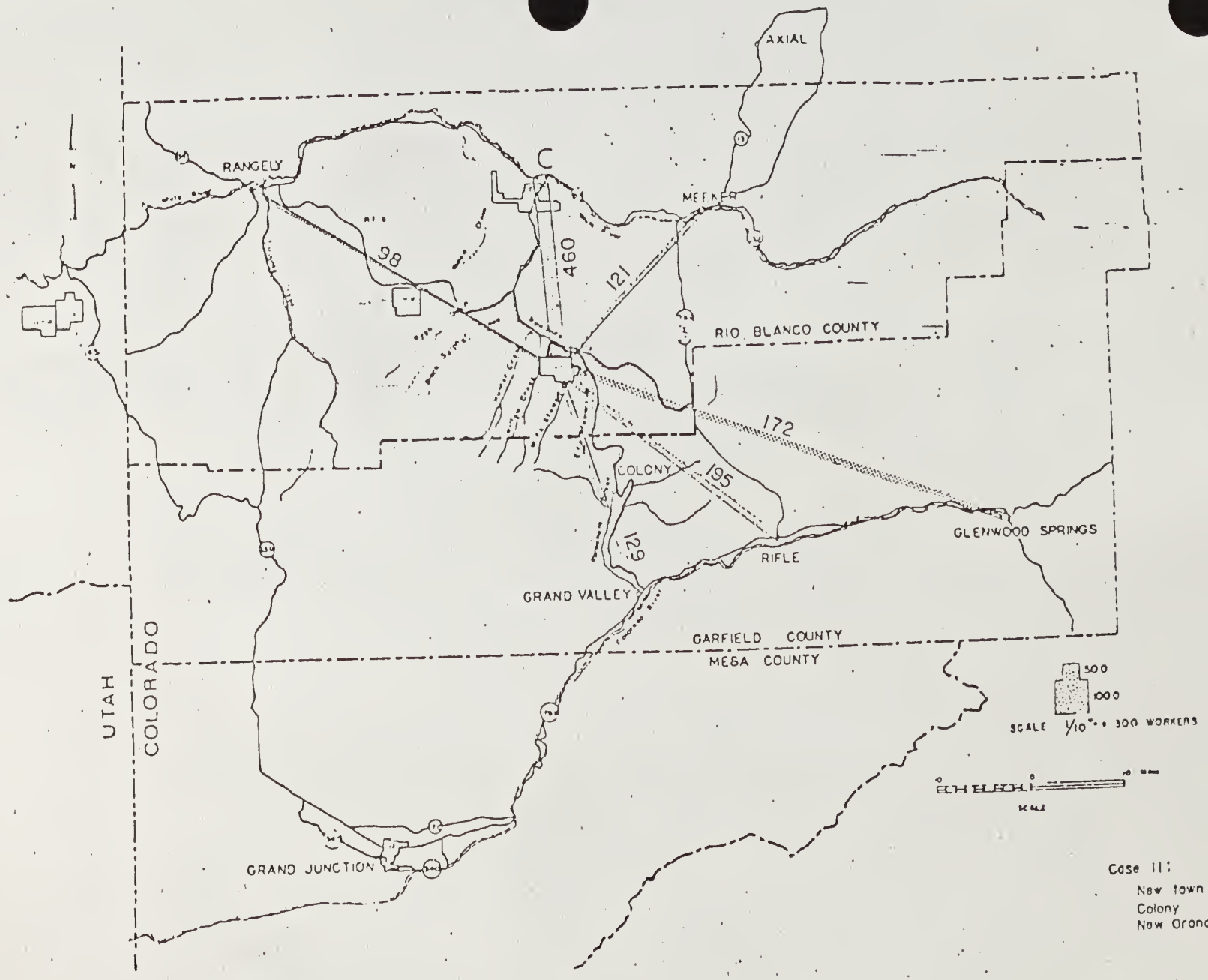
Case 10:

No new town

Colony

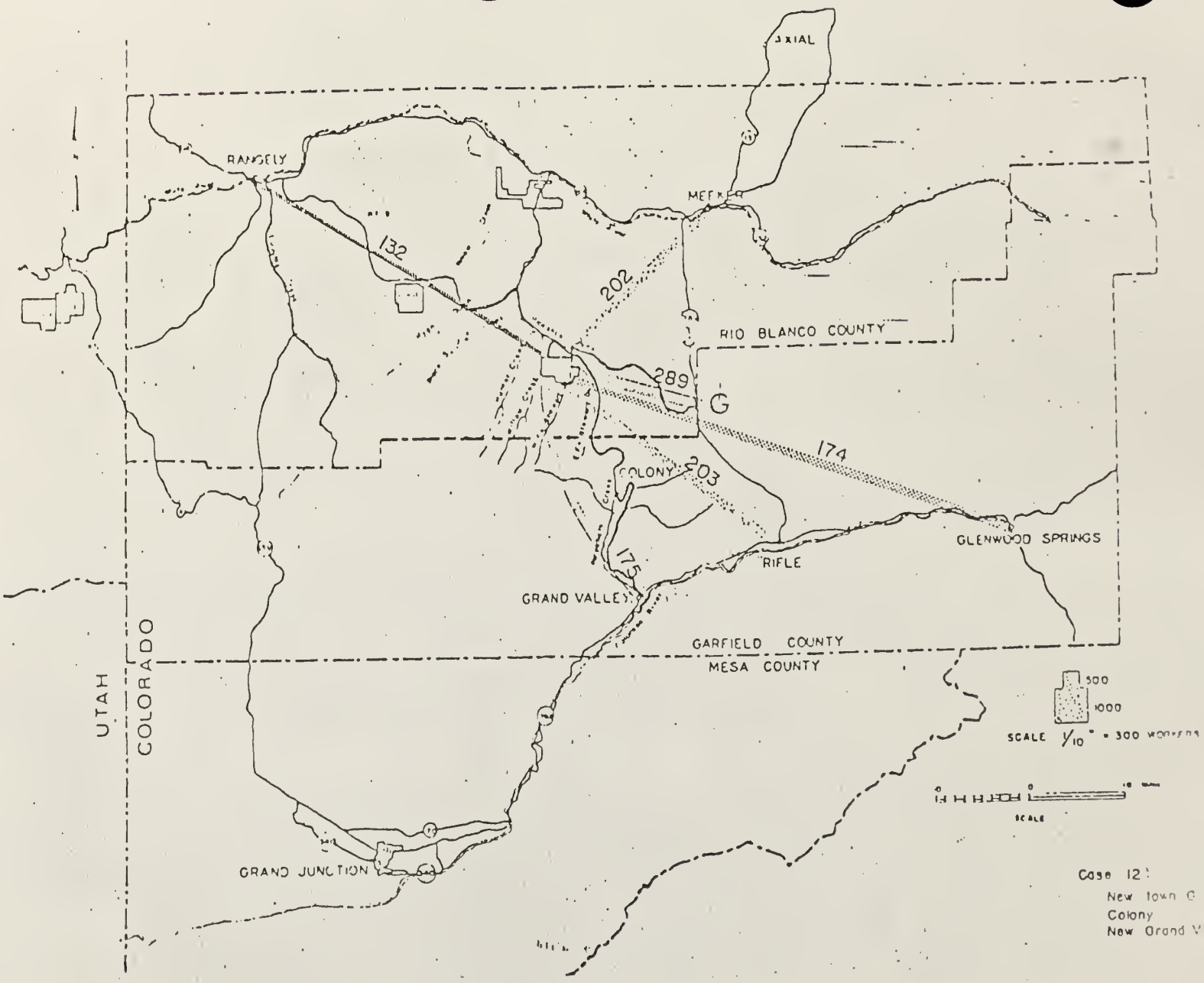
New Grand Valley - CR route

FIGURE 13



Case II:
New town C
Colony
New Grand Valley - CB route

FIGURE 14



Case 12:
New town C
Colony
New Grand Valley - Co ro

FIGURE

ROAD USER COSTS

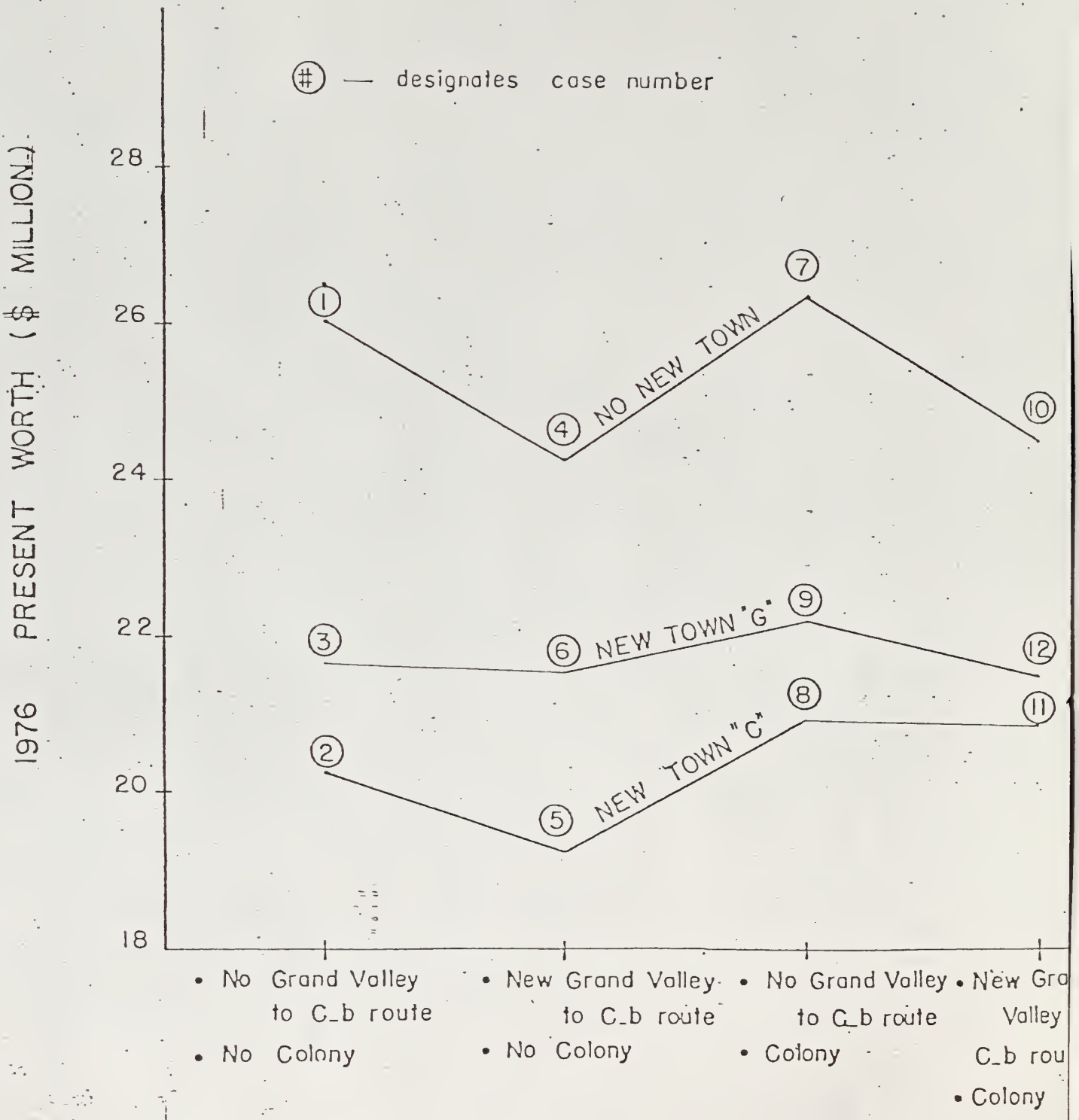

(#) — designates case number
1976 PRESENT WORTH ($ MILLION)
28
26
24
22
20
18
① ② ③ ④ NO NEW TOWN ⑤ NEW TOWN "C" ⑥ NEW TOWN "G" ⑦ ⑧ ⑨ ⑩ ⑪ ⑫
• No Grand Valley to C_b route
• No Colony
• New Grand Valley to C_b route
• No Colony
• No Grand Valley to C_b route
• Colony
• New Gra Valley C_b rou
• Colony

FIGURE 16

Quality Development
Associates, Inc.

RECEIVED
JUL 26 1977
OFFICE OF
AREA OIL SHALE SUPERVISOR
U.S. G.S.

July 25, 1977

Eric Hoffman
Area Oil Shale Supervisor's Office
U. S. Geological Survey
Mesa Federal Savings & Loan, Suite 300
Grand Junction, CO 81501

Dear Eric,

Enclosed is the updated projection for growth in Rifle based upon the most recent Occidental-Ashland manpower figures available as per your request.

The figures were projected to the first year of operations.

If you have any questions, don't hesitate to call.

Sincerely yours,

Donald P. Scrimgeour

Donald P. Scrimgeour, Ph.D.

0302026S7

tin J. Redding, Ph.D.
sident
an B. Dempsey, A.I.P.
Vice President
1700 Broadway
United Bank Center
Suite 830
Denver, Colorado 80290
Telephone (303) 861-9428

7701027

RIFLE POPULATION
Amount of Growth

	Assuming 70-77 Rate Continues		Total Added Impact	40% Capture Rate Rifle		50% Capture Rate Rifle	
Year	Pop.Change	Total Pop.	Population	Added Pop	Total Pop	Added Pop	Total Pop
6-77	--	2242	0	0	2242	0	2242
12-77	7	2249	519	208	2457	260	2509
12-78	13	2262	572	229	2699	286	2808
12-79	14	2276	4609	1844	4557	2304	5126
12-80	14	2290	1863	745	5316	932	6072
12-81	13	2303	6870	2748	8077	3435	9520
12-82	14	2317	1614	646	8737	807	10,341
12-83	14	2331	-4980	-1992	6759	-2490	7865
TOTAL	89	--	11,067	4428	--	5534	--

RATE OF GROWTH

Period of Growth From	To	Assuming 70-77 Rate Continues	40% Capture	50% Capture
6-77	12-77	0.60%	9.59%	11.91%
1-78	12-78	0.60%	9.85%	11.92%
1-79	12-79	0.60%	68.84%	82.55%
1-80	12-80	0.60%	16.66%	18.45%
1-81	12-81	0.60%	51.94%	56.79%
1-82	12-82	0.60%	8.17%	8.62%
1-83	12-83	0.60%	-22.64%	-23.94%
TOTALS				
6-77	12-82	3.35%	289.70%	361.24%
6-77	12-83	3.97%	201.47%	250.80%
Avg. of Yearly Rates		0.60%	20.34%	23.76%
Avg. of Total Rate		0.61%	31.00%	38.58%
Compound Yearly Rate		0.60%	18.50%	21.30%

7701027

Quality Development
Associates, Inc.

RECEIVED
AUG 19 1977
OFFICE OF
AREA OIL SHALE SUPERVISOR
U.S. G.S.

August 17, 1977

Mr. Eric Hoffman
Area Oil Shale Supervisor's Office
U. S. Geological Survey
Mesa Federal Savings & Loan, Suite 300
Grand Junction, CO 81501

Dear Eric:

Enclosed is the updated projection for growth in Meeker based upon the most recent Occidental-Ashland manpower figures available.

The figures were projected to the first year of operations.

If you have any questions, don't hesitate to call.

Sincerely yours,

Ron Moore

Ronald W. Moore
Economist

RWM:mf

cc: Mr. Duane Rehborg w/enclosure

Enclosure

tin J. Redding, Ph.D.
esident
hn B. Dempsey, A.I.P.
Vice President
1700 Broadway
United Bank Center
Suite 830
Denver, Colorado 80290
Telephone (303) 861-9428

77663

MEEKER POPULATION
Amount of Growth

AUG 17 1977

	Assuming 70-77 Rate Continues		Total Added Impact	40% Capture Rate Meeker		50% Capture Rate Meeker	
Year	Pop. Change	Total Pop.	Population	Added Pop.	Total Pop.	Added Pop.	Total Pop.
6-77	--	1848	--	--	1848	--	1848
12-77	19	1867	519	208	2075	260	2127
12-78	39	1906	572	229	2343	286	2452
12-79	40	1946	4609	1844	4227	2304	4796
12-80	41	1987	1863	745	5013	932	5769
12-81	42	2029	6870	2748	7803	3435	9246
12-82	43	2072	1614	646	8492	807	10096
12-83	44	2116	-4980	-1992	6544	-2490	7650
TOTAL	268	--	11,067	4428	--	5534	--

RATE OF GROWTH

Period of Growth From	To	Assuming 70-77 Rate Continues	40 % Capture	50% Capture
6-77	to 12-77	2.11%	12.28%	15.10%
1-78	to 12-78	2.11%	12.92%	15.28%
1-79	to 12-79	2.11%	80.41%	95.60%
1-80	to 12-80	2.11%	18.59%	20.79%
1-81	to 12-81	2.11%	55.66%	60.27%
1-82	to 12-82	2.11%	8.83%	9.19%
1-83	to 12-83	2.11%	-22.94%	-24.23
TOTALS				
6-77 to 12-82		12.12%	359.52%	446.32%
6-77 to 12-83		14.50%	254.11%	313.96%
Avg. of Yearly Rates		2.11%	23.68%	27.36%
Avg. of Total Rate		2.23%	39.09%	48.30%
Compound Yearly Rate		2.11%	21.47%	24.43%

7701163

UNITED STATES DEPARTMENT OF COMMERCE
Bureau of the Census
Washington, D.C. 20233

OFFICE OF THE DIRECTOR

JUL 28 1977

Mr. Burman Lorenson
Socio-Economic Impact Coordinator
Office of the Governor
State Centennial Building, Room 518
1313 Sherman Street
Denver, Colorado 80203

Dear Mr. Lorenson:

The official population counts according to the special censuses of Delta, Garfield, Mesa, Moffat, Rio Blanco, and Routt Counties, Colorado are shown on the enclosed tables. A tabulation which provides the special census population of the counties by age, race, and sex, and the number of occupied and vacant housing units for each census county division, place, school district, enumeration district, and, in Mesa County, each census tract is being sent under separate cover. Maps outlining these areas are being forwarded from our Indiana office.

User tapes for these censuses will be sent to you within approximately 4 weeks. Documentation will also be provided at that time.

A final accounting of the costs incurred will be made at a later date. If you require further information concerning the census, please let us know.

Sincerely,

Daniel B. Levine

DANIEL B. LEVINE
Associate Director
Bureau of the Census

Enclosures

cc:
Colorado Secretary of State
Colorado Department of Revenue
Department of the Interior

JUL 28 1977

UNITED STATES DEPARTMENT OF COMMERCE
Bureau of the Census
Washington, D.C. 20233

OFFICE OF THE DIRECTOR

SPECIAL CENSUS POPULATION OF GARFIELD COUNTY, COLORADO AS OF MARCH 11, 1977

Area	Population
Garfield County (total)	18,800
Glenwood Springs CCD	11,109
Carbondale town	1,644
Glenwood Springs city	4,091
Grand Valley CCD	858
Grand Valley town	377
New Castle CCD	3,278
New Castle town	543
Silt town	859
Rifle CCD	3,555
Rifle town	2,244
School District	
RE 1	11,115
RE 2	6,766
16	772
49 Jt	99
50	48

JUL 31 1977

UNITED STATES DEPARTMENT OF COMMERCE
Bureau of the Census
Washington, D.C. 20233

OFFICE OF THE DIRECTOR

SPECIAL CENSUS POPULATION OF MESA COUNTY, COLORADO AS OF MARCH 21, 1977

Area	Population
Mesa County (total)	66,848
Clifton CCD	5,913
Collbran CCD	1,364
Collbran town	293
DeBeque CCD	427
DeBeque town	264
Fruita CCD	7,709
Fruita town	2,328
Glade Park-Gateway CCD	797
Grand Junction CCD	35,871
Grand Junction city	25,398
Orchard Mesa CCD	5,012
Palisade CCD	2,178
Palisade town	1,038
Redlands CCD	6,826
Whitewater-Kannah Creek CCD	751
School District	
49 Jt	399
50	1,364
51	65,085
50 (part)	-

UNITED STATES DEPARTMENT OF COMMERCE
Bureau of the Census
Washington, D.C. 20233

OFFICE OF THE DIRECTOR

JUL ? 1977

SPECIAL CENSUS POPULATION OF RIO BLANCO COUNTY, COLORADO AS OF MARCH 16, 1977

Area	Population
Rio Blanco County (total)	5,100
Meeker CCD	2,779
Meeker town	1,848
Rangely CCD	2,321
Rangely town	1,871
School District	
RE 1	2,777
RE 3	2
RE 4	2,321